

TABLE 3.3-6

<u>RADIATION MONITORING INSTRUMENTATION</u>					
<u>INSTRUMENT</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ALARM/TRIP SETPOINT</u>	<u>MEASUREMENT RANGE</u>	<u>ACTION</u>
1. AREA MONITORS					
a. Spent Fuel Pool Area Monitor	1	Note 1	$\leq 1.5 \times 10^{-2}$ R/hr	$10^{-4} - 10^1$ R/hr	13
b. Containment High Range	2	1, 2, 3, & 4	Not Applicable	$1 - 10^7$ R/hr	18
2. PROCESS MONITORS					
a. Containment Purge and Exhaust Isolation	1	5 & 6	$\leq 2 \times$ background	$10 - 10^6$ cpm	16
b. Control Room Ventilation Intake Duct Monitors	2	Note 2	$\leq 2 \times$ background	$10 - 10^6$ cpm	17, 20
c. Main Steam Line Radiation Monitors	1/Steam Line	1, 2, 3, & 4	Not Applicable	$10^{-1} - 10^4$ mR/hr	19

Note 1 - With fuel in the spent fuel pool or building.

Note 2 - MODES 1, 2, 3, 4, and during handling of irradiated fuel.

TABLE NOTATION

- ACTION 13 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.
- ACTION 16 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, complete the following:
- a. If performing CORE ALTERATIONS or moving irradiated fuel within the reactor building, secure the containment purge system or suspend CORE ALTERATIONS and movement of irradiated fuel within the reactor building.
  - b. If a containment PURGE is in progress, secure the containment purge system.
  - c. If continuously ventilating, verify the SPING monitor operable or perform the ACTIONS of 3.3.3.9, or secure the containment purge system.
- ACTION 17 - With no channels OPERABLE, within 1 hour initiate and maintain operation of the control room emergency ventilation system in the recirculation mode of operation.
- ACTION 18 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, (1) either restore the inoperable channel to OPERABLE status within 7 days or (2) prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days following the event, outlining the action taken, the cause of the inoperability, and the plans and schedule for restoring the system to OPERABLE status. With both channels inoperable, initiate alternate methods of monitoring the containment radiation level within 72 hours in addition to the actions described above.
- ACTION 19 - With the number of OPERABLE Channels less than required by the Minimum Channels OPERABLE requirements, initiate the preplanned alternate method of monitoring the appropriate parameter(s), within 72 hours, and:
- 1) either restore the inoperable Channel(s) to OPERABLE status within 7 days of the event, or
  - 2) prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 14 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.
- ACTION 20 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 7 days, or within the next 6 hours initiate and maintain the control room emergency ventilation system in the recirculation mode of operation.

TABLE 4.3-3

RADIATION MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
1. AREA MONITORS				
a. Spent Fuel Pool Area Monitor	S	R	M	Note 1
b. Containment High Range	S	R Note 4	M	1, 2, 3, & 4
2. PROCESS MONITORS				
a. Containment Purge and Exhaust Isolation	Note 2	R	Note 3	5 & 6
b. Control Room Ventilation Intake Duct Monitors	S	R	M	Note 5
c. Main Steam Line Radiation Monitors	S	R	M	1, 2, 3, & 4

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Note 1 - With fuel in the spent fuel pool or building.

Note 2 - Within 8 hours prior to initiating containment purge operations and at least once per 12 hours during containment purge operations.

Note 3 - Within 31 days prior to initiating containment purge operations and at least once per 31 days during containment purge operations.

Note 4 - Acceptable criteria for calibration are provided in Table II.F.1-3 of NUREG-0737.

Note 5 - MODES 1, 2, 3, 4, and during handling of irradiated fuel.

## REACTOR COOLANT SYSTEM

### 3/4.4.6 REACTOR COOLANT SYSTEM LEAKAGE

#### LEAKAGE DETECTION SYSTEMS

#### LIMITING CONDITION FOR OPERATION

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3.4.6.1 The following Reactor Coolant System leakage detection instrumentation shall be OPERABLE:

- a. One containment sump level monitor
- b. One containment atmosphere particulate radioactivity monitor, and
- c. One containment atmosphere gaseous radioactivity monitor.

APPLICABILITY: MODES 1, 2, 3 and 4.

#### ACTION:

- a. With one or more containment atmosphere radioactivity monitor(s) inoperable, operation may continue for up to 30 days for each inoperable monitor provided:
  1. grab samples of the containment atmosphere are obtained and analyzed at least once per 24 hours, or
  2. a Reactor Coolant System water inventory balance is performed at least once per 24 hours in accordance with Surveillance Requirement 4.4.6.2.1.a;\*otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With the containment sump level monitor inoperable, operation may continue for up to 30 days provided a Reactor Coolant System water inventory balance is performed at least once per 24 hours in accordance with Surveillance Requirement 4.4.6.2.1.a;\* otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- c. With the containment sump level monitor inoperable and one containment atmosphere radioactivity monitor inoperable, operation may continue for up to 30 days for each inoperable monitor provided a Reactor Coolant System water inventory balance is performed at least once per 24 hours in accordance with Surveillance Requirement 4.4.6.2.1.a;\* otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- d. The provisions of Specification 3.0.4 are not applicable.

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\*Not required until 12 hours after establishment of steady state conditions.

REACTOR COOLANT SYSTEM

3/4.4.6 REACTOR COOLANT SYSTEM LEAKAGE

LEAKAGE DETECTION SYSTEMS

SURVEILLANCE REQUIREMENTS

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- 4.4.6.1 The leakage detection instrumentation shall be demonstrated OPERABLE by:
- a. Performing a CHANNEL CHECK of the required containment atmosphere radioactivity monitors at least once per 12 hours.
  - b. Performing a CHANNEL CHECK of the containment sump level monitor at least once per 12 hours.
  - c. Performing a CHANNEL FUNCTIONAL TEST of the required containment atmosphere radioactivity monitors at least once per 31 days.
  - d. Performing a CHANNEL CALIBRATION of the containment sump level monitor at least once per 18 months.
  - e. Performing a CHANNEL CALIBRATION of the required containment atmosphere radioactivity monitors at least once per 18 months.

REACTOR COOLANT SYSTEM

REACTOR COOLANT SYSTEM LEAKAGE

SURVEILLANCE REQUIREMENTS

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- 4.4.6.2.1 Reactor Coolant System leakages shall be demonstrated to be within each of the above limits by:
- a. Performance of a Reactor Coolant System water inventory balance at least once per 72 hours during steady state operation except when operating in the shutdown cooling mode.
  - b. Monitoring the reactor head flange leakoff temperature at least once per 24 hours.
- 4.4.6.2.2 Each Reactor Coolant System Pressure Isolation Valve specified in Table 3.4.6-1 shall be demonstrated OPERABLE by individually verifying leakage to be within its limit:
- a. Prior to entering MODE 2 after each refueling outage,
  - b. Prior to entering MODE 2 whenever the plant has been in COLD SHUTDOWN for 72 hours or more and if leakage testing has not been performed in the previous 9 months, and
  - c. Prior to returning the valve to service following maintenance, repair or replacement work on the valve.

## REACTOR COOLANT SYSTEM

### BASES

Wastage type defects are unlikely with proper chemistry treatment of the secondary coolant. However, even if a defect should develop in service, it will be found during scheduled inservice steam generator tubes examinations. Plugging will be required for all tubes with imperfections exceeding the plugging limit as defined in Surveillance Requirement 4.4.5.4.a. Steam generator tube inspections of operating plants have demonstrated the capability to reliably detect degradation that could affect tube wall integrity. Additionally, upgraded testing methods will be evaluated and appropriately implemented as better methods are developed and validated for commercial use.

Whenever the results of any steam generator tubing inservice inspection fall into Category C-3 certain results will be reported in a Special Report to the Commission pursuant to Specification 6.9.2 as denoted by Table 4.2-2. Notification of the Commission will be made prior to resumption of plant operation. Such cases will be considered by the Commission on a case-by-case basis and may result in a requirement for analysis, laboratory examinations, tests, additional eddy-current inspection, and revision of the Technical Specifications, if necessary.

### 3/4.4.6 REACTOR COOLANT SYSTEM LEAKAGE

#### 3/4.4.6.1 LEAKAGE DETECTION SYSTEMS

GDC 30 of Appendix A to 10 CFR 50 requires means for detecting and, to the extent practical, identifying the location of the source of RCS LEAKAGE. The RCS leakage detection systems required by this specification are provided to monitor and detect leakage from the Reactor Coolant Pressure Boundary. These detection systems are consistent with the recommendations of Regulatory Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems" May 1973. Likewise, the actions implemented upon inoperability of a required leak detection instrument are sufficient in maintaining the diversity and accuracy needed to effectively detect RCS leaks.

Industry practice has shown that water flow changes of 0.5 gpm to 1.0 gpm can readily be detected in contained volumes by monitoring changes in water level, in flow rate, or in the operating frequency of a pump. In addition, the reactor coolant contains radioactivity that, when released to the containment, can be detected by radiation monitoring instrumentation. Instrument sensitivities of  $10 - 10^6$  cpm for particulate and gaseous monitoring are practical for these leakage detection systems.

12 hours is provided by a footnote to allow for plant stabilization before performance of the required reactor coolant inventory balance. This provision is necessary to ensure an accurate measurement is obtained.

## REACTOR COOLANT SYSTEM

### BASES

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#### 3/4.4.6.2 REACTOR COOLANT SYSTEM LEAKAGE

Industry experience has shown that while a limited amount of leakage is expected from the RCS, the unidentified portion of this leakage can be reduced to a threshold value of less than 1 GPM. This threshold value is sufficiently low to ensure early detection of additional leakage.

The 10 GPM IDENTIFIED LEAKAGE limitation provides allowances for a limited amount of leakage from known sources whose presence will not interfere with the detection of UNIDENTIFIED LEAKAGE by the leakage detection systems.

The Surveillance Requirements for RCS Pressure Isolation Valves provide added assurance of valve integrity thereby reducing the probability of gross valve failure and consequent intersystem LOCA. Leakage from the RCS Pressure Isolation Valves is IDENTIFIED LEAKAGE and will be considered as a portion of the allowed limit.

The total steam generator tube leakage limit of 300 gallons per day for all steam generators ensures that the dosage contribution from the tube leakage will be limited to a small fraction of Part 100 limits in the event of either a steam generator tube rupture or steam line break. The 150 gallon per day leakage limit per steam generator ensures that steam generator tube integrity is maintained in the event of a main steam line rupture or under LOCA conditions.

PRESSURE BOUNDARY LEAKAGE of any magnitude is unacceptable since it may be indicative of an impending gross failure of the pressure boundary. Therefore, the presence of any PRESSURE BOUNDARY LEAKAGE requires the unit to be promptly placed in COLD SHUTDOWN.

#### 3/4.4.7 CHEMISTRY

The limitations on Reactor Coolant System chemistry ensure that corrosion of the Reactor Coolant System is minimized and reduce the potential for Reactor Coolant System leakage or failure due to stress corrosion. Maintaining the chemistry within the Steady State Limits provides adequate corrosion protection to ensure the structural integrity of the Reactor Coolant System over the life of the plant. The associated effects of exceeding the oxygen, chloride and fluoride limits are time and temperature dependent. Corrosion studies show that operation may be continued with contaminant concentration levels in excess of the Steady State Limits, up to the Transient Limits, for the specified limited time intervals without having a significant effect on the structural integrity of the Reactor Coolant System. The time interval permitting continued operation within the restrictions of the Transient Limits provides time for taking corrective actions to restore the contaminant concentrations to within the Steady State Limits.

The surveillance requirements provide adequate assurance that concentrations in excess of the limits will be detected in sufficient time to take corrective action.

#### 3/4.4.8 SPECIFIC ACTIVITY

The limitations on the specific activity of the primary coolant ensure that the resulting 2-hour doses at the site boundary will not exceed an appropriately small fraction of Part 100 limits following a